(19) Europäisches Patentamt
European Patent Office
Office uropéen des brevets

(11) Publication number: **0 137 670**
B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication of patent specification: **04.05.88**

(51) Int. Cl.⁴: **F 28 D 19/04**, F 24 F 3/147

(21) Application number: **84305686.2**

(22) Date of filing: **21.08.84**

(54) Controlling seal systems in rotary regenerative air preheaters.

(30) Priority: **23.09.83 GB 8325512**

(43) Date of publication of application:
17.04.85 Bulletin 85/16

(45) Publication of the grant of the patent:
04.05.88 Bulletin 88/18

(84) Designated Contracting States:
DE FR GB

(56) References cited:
GB-A-2 091 003
US-A-3 232 335
US-A-3 999 597
US-A-4 301 858

(73) Proprietor: **DAVIDSON & COMPANY LIMITED**
Sirocco Engineering Works Bridge End
Belfast BT5 4AG Northern Ireland (GB)

(72) Inventor: **Gibson, Stanley**
22 Belgravia Road
Bangor Co. Down Northern Ireland (GB)
Inventor: **Tindall, Colin**
77 Magharatimpany Road
Ballynahinch Co. Down Northern Ireland (GB)

(74) Representative: **Harrison, David Christopher et al**
MEWBURN ELLIS & CO 2/3 Cursitor Street
London EC4A 1BQ (GB)

EP 0 137 670 B1

Courier Press, Leamington Spa, England.

Suitable sensors for use on a stationary matrix machine are to be seen in our said UK application 2091003, these sensing the proximity of comparatively massive sealing frames on the hoods. Wiring 17 from each of these sensors is taken to a control cabinet 18.

In the control cabinet the input Xp from each of the sensor assemblies S1—S8 successively is processed in circuit 2 and compared with a demand position signal Xd generated in circuit 1.

The signal Xi derived from the comparison in the comparator is fed to the power circuitry 3 and thence through conventional power slip rings 4 to magnetic drive devices 5 mounted on the rotating hoods, to lift the sealing frames or allow them to lower. Such magnetic drive devices are disclosed in our GB—A—1559679 as well as in the GB—A—2091003.

The signal Xi to the magnetic drive device 5 causes it to move in an appropriate direction to adjust the gap between the seal frame 13 and the sensor assemblies S1—S8. This signal is maintained until a signal from a succeeding sensor out of the sensor assemblies S1—S8 indicates, as the hood passes it, that the gap is now wrongly set when that signal will alter the signal Xi and cause an adjustment in the positioning of the sealing frame.

It can be seen that all the sensing and comparatively low amplitude signal circuitry is stationary; the control box may be and preferably is quite remote from the regenerator so that its electronic elements are not subject to the hostile environment in which the regenerator works. However, control signals passing from that box to the magnetic drive devices being of comparatively high amplitude or power can readily pass through conventional slip ring constructions to the drive devices borne on the rotating part. Furthermore, the sensor assemblies S1—S8 are arranged in a bridge circuit so that they are unaffected by temperature variations.

Attention is drawn to our EP—A—0 222 463 (published on 20.5.87) which is divided from the present patent.

Claims

1. A rotary regenerative air preheater of the stationary matrix type comprising a stationary matrix (11) and sealing frames (13) borne on rotatable hoods (14), a plurality of electromagnetic drive means (5) on the hoods for driving the sealing frames (13) in a predetermined axial relationship, a plurality of electrical sensors (S1—8) passed during relative rotation of the sealing frames, a control circuit and slip rings (4) about the axis of rotation of the hoods (14) for electrical communication between stationary and rotating parts of the preheater, including means for comparing the sensed axial sealing relationship at each sensor with a predetermined axial sealing relationship and driving the associated driv means to bring the sealing means (13) to the predetermined axial sealing relationship, characterised in that the sensors (S1—8) are on a non-rotating part of the preheater to be passed sequentially during one rotation, the control circuit being common to the sensors and linking each of them to at least one of the electrical drive means (5), whereby the sealing means is sequentially checked and adjusted by the control circuit as necessary on a plurality of occasions during each relative rotation, power signals to the drive means being transmitted via the slip rings (4).

2. A rotary regenerative air preheater according to claim 1 wherein the sensors (S1—8) are inductance sensors.

3. A rotary regenerative air preheater according to claim 1 or claim 2 wherein the predetermined axial relationship is a gap of between 1 and 2 mm.

4. A rotary regenerative air preheater according to any one of the preceding claims wherein the sensors are connected by wiring (17) with a control box (18) which is mounted stationary and remote from the preheater.

Patentansprüche

1. Umlaufender Regenerativ-Luftvorwärmer der ortsfesten Matrixbauart, bestehend aus einer ortsfesten Matrix (11) und von umlaufenden Hauben (14) getragenen Dichtrahmen (13), mehreren elektromagnetischen Antrieben (5) an den Hauben zum Antreiben der Dichtrahmen (13) in einer bestimmten axialen Beziehung, mehreren elektrischen Sensoren (S1—8), an denen sich die Dichtrahmen während der Relativverdrehung vorbeibewegen, einem Steuerkreis und Gleitringen (4), die die Drehachse der Hauben (14) umgeben, zur elektrischen Verbindung zwischen ortsfesten und umlaufenden Teilen des Luftvorwärmers mit Einrichtungen zum Vergleichen der ermittelten axialen Dichtungsbeziehung an jedem Sensor mit einer vorbestimmten axialen Dichtungsbeziehung und zum Betätigen des zugeordneten Antriebs, um die Dichtungsrahmen (13) in die vorbestimmte axiale Dichtungsbeziehung zu bringen, dadurch gekennzeichnet, daß die Sensoren (S1—8) auf einem nicht umlaufenden Teil des Luftvorwärmers angeordnet sind, im während eines Umlaufs nacheinander überstrichen zu werden, wobei der Steuerkreis den Sensoren gemeinsam ist und jeden von ihnen mit mindestens einem der elektrischen Antriebe (5) verbindet, wodurch die Dichtungseinrichtung während einer jeden relativen Verdrehung durch den Steuerkreis erforderlichenfalls mehrmals nacheinander überprüft und nachgestellt wird, wobei Antriebssignale an die Antriebe über die Schleifringe (4) übertragen werden.

2. Umlaufender Regenerativ-Luftvorwärmer nach Anspruch 1, wobei die Sensoren (S1—8) Induktionssensoren sind.

3. Umlaufender Regenerativ-Luftvorwärmer nach Anspruch 1 oder 2, wobei die vorbestimmte Axialbeziehung ein Spalt von 1 bis 2 mm ist.

4. Umlaufender Regenerativ-Luftvorwärmer nach einem der vorhergehenden Ansprüche, wobei die Sensoren durch eine Verdrahtung (17)

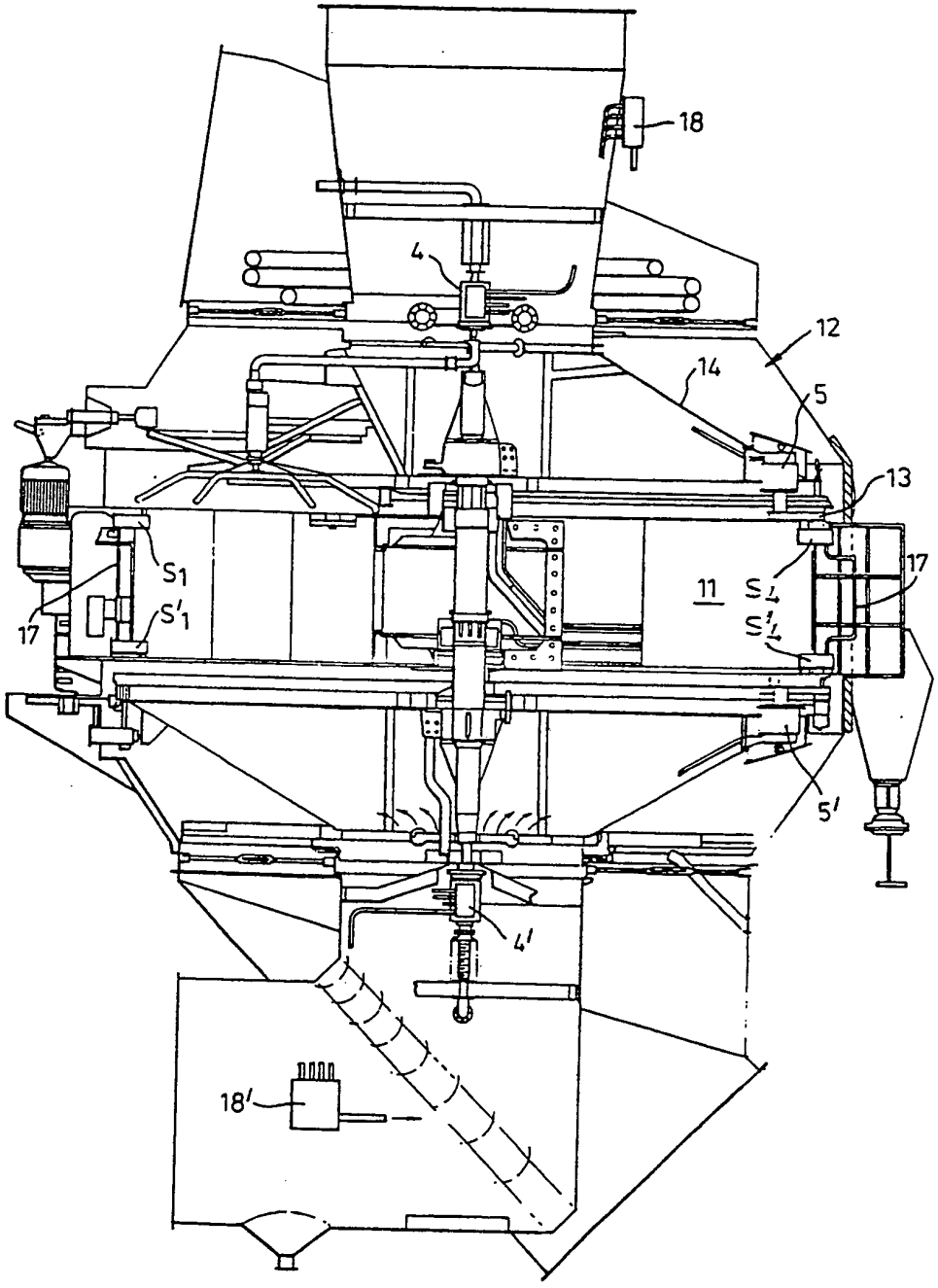

Fig.1.